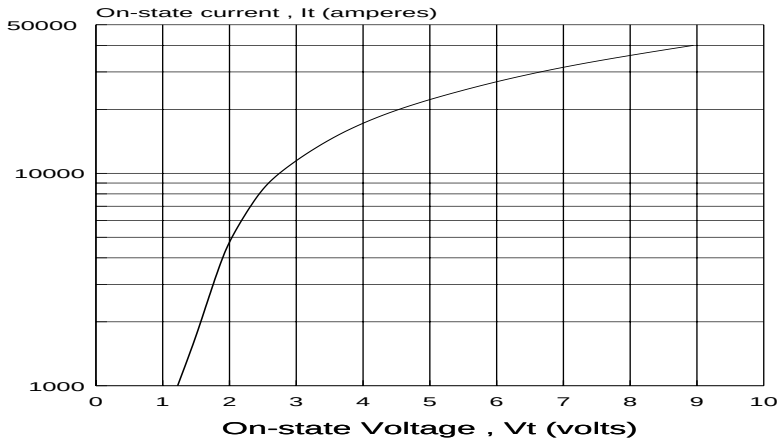
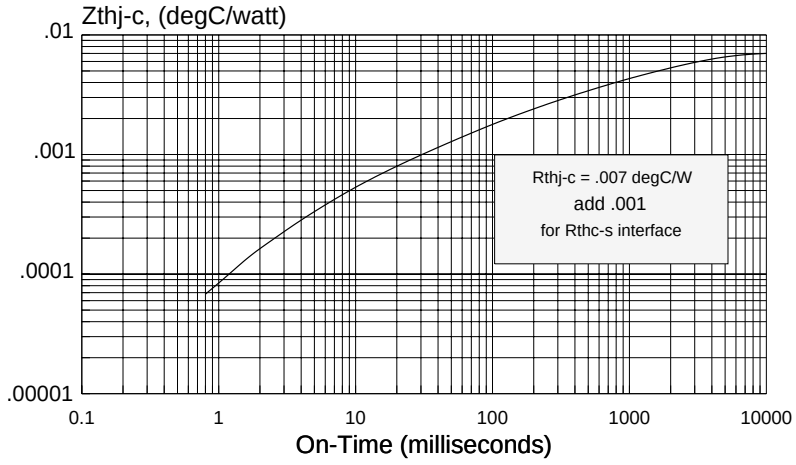
C791A
100mm THYRISTOR PRESSPAK
4500V / 3250A

Type C791A thyristor is suitable for phase control applications such as for HVDC valves,static VAR compensators and synchronous motor drives.The silicon junction design utilizes a second generation pilot gate and a unique orientation of emitter shorts which promote the lateral expansion of conducting plasma resulting in lower spreading losses while achieving high dv/dt withstand.It is supplied in an industry accepted disc-type package,ready to mount using commercially available heat dissipators and mechanical clamping hardware.

MAXIMUM ON-STATE CHARACTERISTIC
Initial Tj=125 degC



THERMAL IMPEDANCE vs. TIME
Junction to Case (DC)

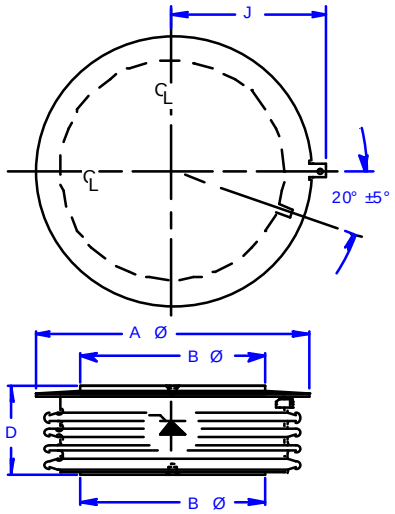


REPETITIVE PEAK REVERSE AND OFF-STATE BLOCKING VOLTAGE

T_J = 0 to 125°C

MODEL	V_{DRM} (volts)	V_{RRM} (volts)
C791ADE	4500	4500
C791ADD	4400	4400
C791ADC	4300	4300
C791ADB	4200	4200
C791ADA	4100	4100
C791ADP	4000	4000

MECHANICAL OUTLINE



AΦ = 5.65 in (143.5 mm)
BΦ=3.92 in (99.4 mm)
D=1.45in (36.8 mm)

ELECTRICAL CREEPAGE / STRIKE
1.6 / 1.0 in
40.6 / 25.4 mm

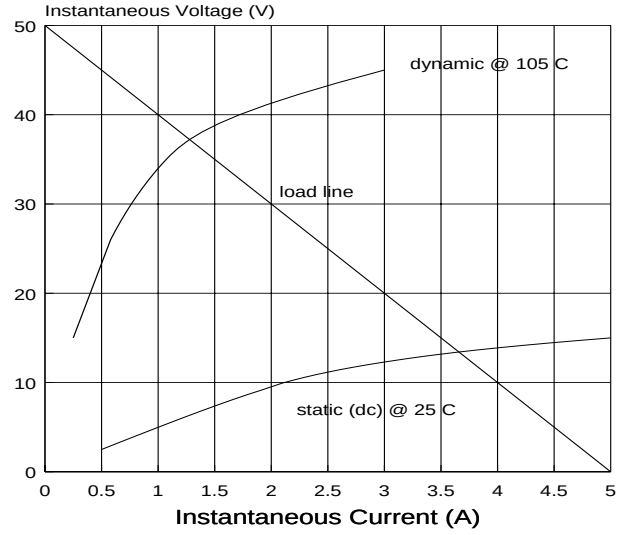
CLAMPING FORCE
(range)
17000 - 19000 lb
75 - 84 kN

SILICON POWER CORPORATION
175 GREAT VALLEY PKWY. MALVERN, PA 19355
USA

LIMITING CHARACTERISTICS AND RATINGS

Repetitive peak off-state & reverse volts	V_{DRM} V_{RRM}	T_J=0 to 125°C	up to 4500	V
Repetitive working crest voltage	V_{DWM} V_{DRM}	T_J=0 to 125°C	$0.8V_{DRM}$ $0.8V_{RRM}$	
Off-state & reverse leakage current	I_{DRM} I_{RRM}	T_J=0 to 125°C	450 350	ma
Average on-state current	$I_{T(AV)}$	T_{case}= 70°C	3250	A
Peak half-cycle non-rep surge current	I_{TSM}	60 Hz 50 Hz	42 38	kA
On-state voltage	V_{TM}	I_T=4000A t_P=8.3ms T_J=125°C	2.00	V
Critical rate of rise of on-state current	di/dt rep	T_J=125°C 60 Hz	100	A/us
Critical rate of rise of off-state voltage	dv/dt	T_J=125°C V_D=.67V_{DRM}	1000	V/us
Recovery current	I_{RM}	T_J=105°C 2A/us 5A/us	90 195	A
Turn-on delay	t_d	Vd=.5V_{DRM}	4	us
Turn-off time	T_{off}	5A/us,-100V 20V/us to 2000V	500	us
Thermal resistance	R_{thJC}		.007	c/w
Externally applied clamping force	F		17000 -19000	lbs.

Gate Characteristics and
Gate Supply Requirements



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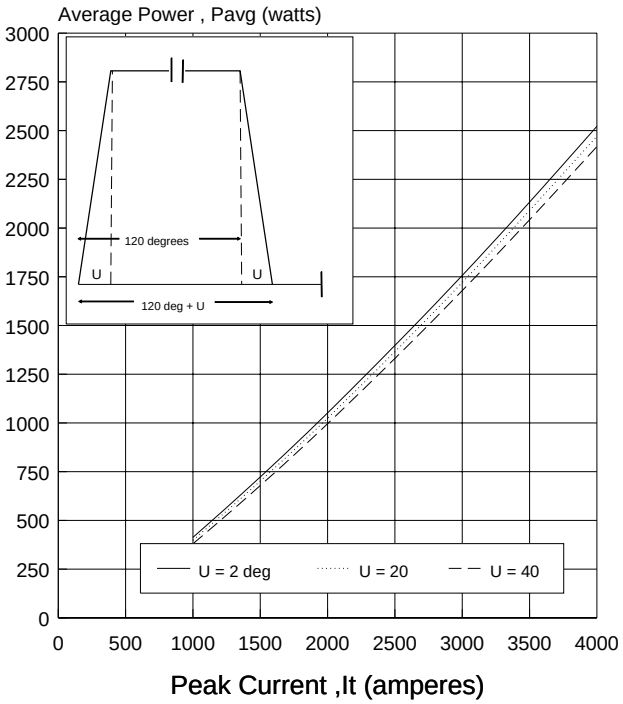
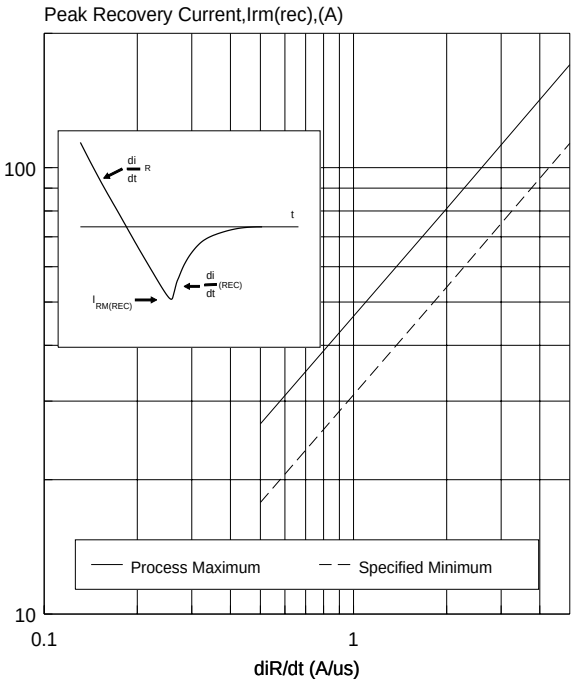
- THYRISTOR GATE IMPEDANCE
  Enhanced by fast rising gate voltage,increasing anode bias and junction temperature.It is at a minimum for dc current, zero anode bias and low temperature.
- GATE SUPPLY
  Prefer 50V/10 ohm for supporting the di/dt rating and life expectancy. The short circuit current risetime should be nominally 0.5us and the duration longer than the expected delay time for all magnitudes of anode bias. Practically 10-30us is recommended followed by a back porch of 750ma if needed to sustain conduction.
- MINIMUM ACCEPTABLE GATE CURRENT
  The intersection of the load line and gate impedance characteristic indicates the minimum value of actual current needed during the delay time interval to support di/dt.A different load line meeting this criterion may be used.
- MAXIMUM GATE RATINGS
  Peak gate power,Pgm(100us) = 300 W
  Average gate power,Pg(av) = 50W
  Peak gate current,Igfm = 25 A
  Peak reverse voltage,Vgrm = 25 V

FULL CYCLE AVERAGE POWER DISSIPATION
120-deg Conduction -includes spread loss
as function of Overlap Angle , U



4500V 100mm

PEAK RECOVERY CURRENT
versus
COMMUTATING di/dt



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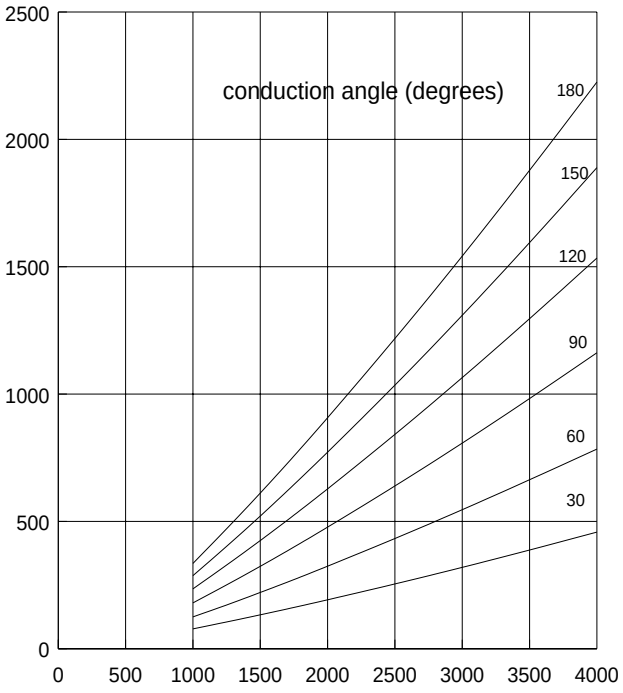
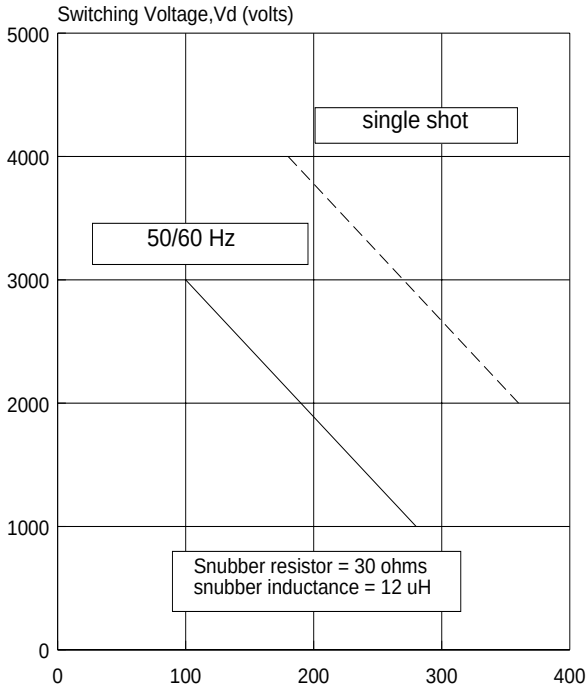
FULL CYCLE AVERAGE POWER DISSIPATION
Sine Wave - includes spread loss
as function of conduction angle



4.5kv 100mm

INRUSH CURRENT (di/dt) RATING
versus
SWITCHING VOLTAGE



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